## REMARKS

The Office Action dated December 1, 2003 has been received and carefully noted. The above amendments to the specification and claims, and the following remarks, are submitted as a full and complete response thereto.

The specification has been amended to correct typographical errors. Claims 1, 13, 24, 32 and 33 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added by the amendments to the specification and claims. Thus, claims 1-34 are pending in the present application and are respectfully submitted for consideration.

As a preliminary matter, the Office Action indicated that claim 20 is allowable and that claims 13-15, 24-27, 33 and 34 would be allowable if amended to be in independent form. Amended claims 13, 24 and 33 are submitted to place the subject matter of these claims in condition for allowance. Applicant acknowledges with appreciation the finding of allowable subject matter.

The drawings are objected to as allegedly failing to comply with 37 C.F.R. §1.84(p)(5) for including reference signs not mentioned in the specification. Applicant has amended the specification to include the reference signs. Thus, the objection is rendered moot. With regard to reference sign 514 of Figure 5, Applicant submits that this reference number is disclosed in the specification on page 23, line 6.

The Office Action also objected to the drawings under 37 C.F.R. §1.83(a). The Office Action alleged that "the linear protection circuit, and the 1+1 linear protection

circuit signal duplicator" as claimed in claims 11-13 is not shown. Applicant respectfully traverses. Applicant submits that the specification on page 16 when combined with the illustration in Figure 2 of protection switches 224, 242, 244 and 252 illustrate this aspect of the claims. As discussed in the specification, the "out-band signals from the band splitter 22 are routed directly to the OADM/OXC 230 and directed to the band combiner 250." In order to reach band combiner 250 from OADM/OXC 230, signals pass through protection switch 224 or protection switch 252. Applicant submits that the protection switches function as a linear protection circuit because the second wavelength range is the outbound signals. With respect to the 1+1 linear protection circuit of claim 12 and the signal duplicator of claim 13, the protection switches disclose these features of the claimed invention. Further, Figure 3 illustrates node 302 within ring network 300 having an OCH protection trace input thereto, and information therefrom is duplicated on working paths 310 and 320, as illustrated by dashed lines 340a and 340b. These features illustrate a type of duplicator according to the claimed invention. Thus, the linear protection circuit, the 1+1 linear protection circuit and signal duplicator are shown in the drawings. Thus, applicant submits the objection is rendered moot.

Claims 1 and 32 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,570,685 (*Fujita et al.*) in view of U.S. Patent No. 6,631,018 (*Milton et al.*) The Office Action took the position that *Fujita* disclosed all the elements of the claimed invention, with the exception of "such bi-directional network is in a predefined low-attenuation region of an optical transmission spectrum." *Milton* was

cited as curing the deficiencies in *Fujita*, and the Office Action took the position it would have been obvious to a person of ordinary skill in the art to combine *Fujita* and *Milton* to yield the claimed invention. Applicant respectfully submits that the presently pending claims recite subject matter that is neither disclosed nor suggested in the cited references.

Claim 1, upon which claims 2-19 depend, recites a network node circuit for use in wavelength division multiplexing optical networks to allow utilization of a wide optical communication band. The node circuit includes a band splitter having an input to receive a plurality of optical signals sent on a corresponding plurality of wavelengths of an optical communication band, and to separate a first plurality of the optical signals within a first wavelength range within an amplification band of the optical communication band from a second plurality of the optical signals within a second wavelength range outside the amplification band of the optical communication band. The node circuit also includes a cross-connect circuit having input ports to receive the first and second pluralities of the optical signals and to route the first and second pluralities of the optical signals through the cross-connect circuit to targeted output ports. The node circuit also includes a band combiner coupled to the cross-connect circuit to receive the first and second pluralities of the optical signals, and to combine the first and second pluralities of the optical signals to an aggregate plurality of optical signals for transmission from the network node.

Claim 32, upon which claims 33 and 34 depend, recites a bi-directional optical network for communicating information in a predefined low-attenuation region of an optical transmission spectrum. The optical network includes a pair of working optical

fibers configured in a ring, each of the working fibers for transmitting the optical signals of the optical transmission spectrum in opposite directions. The optical network also includes a pair of ring protection fibers configured in a ring, each of the ring protection fibers associated with one of the working fibers for transmitting one of the working fibers for transmitting the optical signals of its corresponding working optical fiber upon a failure of its corresponding working optical fiber. The optical network also includes a plurality of network nodes, each interposed along the rings of working optical fibers and the ring protection fibers to produce a ring network topology.

Each of the network nodes includes a band splitter having an input to receive a plurality of optical signals sent on a corresponding plurality of wavelengths of an optical communication band, and to separate a first plurality of the optical signals within a first wavelength range within an amplification band of the optical communication band from a second plurality of the optical signals within a second wavelength range outside the amplification band of the optical communication band. Each of the network nodes also includes a cross-connect circuit having input ports to receive the first and second pluralities of the optical signals and to route the first and second pluralities of the optical signals through the cross-connect circuit to targeted output ports. Each of the network nodes also includes a band combiner coupled to the cross-connect circuit to receive the first and second pluralities of the optical signals, and to combine the first and second pluralities of the optical signals into an aggregate plurality of optical signals for transmission from the network node. The optical network also includes a ring protection

circuit coupled to the band splitter to switch the first plurality of optical signals from the working optical fiber to an associated ring protection fiber upon recognition of the failure of its corresponding working optical fiber.

*Fujita* relates to a node for optical communication and a wavelength-division multiplexing transmission apparatus having a ring structure composed of the same nodes. *Fujita* describes each of the nodes sending out an optical signal attained by multiplexing n wavelengths in the wavelength division to each of the four optical fiber transmission paths. The multiplexing and demulitplexing operations of *Fujita* are performed by receiving an optical signal from a transmission path optical fiber and demultiplexing the signal into n wavelength components. *Fujita*, however, does not disclose or suggest a band splitter to separate a first plurality of optical signals within a first wavelength range within an amplification band of the optical communication band from a second plurality of the optical signals within a second wavelength range outside the amplification band of the optical communication band.

*Milton* relates to a wavelength-division multiplexing optical network with passive pass-through at each node. A filter at each node drops a band associated with a plurality of wavelengths and passively forwards other bands through a transmission medium. The transmission medium is capable of carrying a plurality of wavelengths organized into bands. A filter at each node drops a band associated and passively forwards other bands through the transmission medium. *Milton*, however, does not disclose or suggest a band splitter to separate a first plurality of the optical signals within a first wavelength range

within an amplification band of the optical communication band from a second plurality of optical signals within a second wavelength outside the amplification band of the optical communication band.

In contrast, claim 1 recites "a band splitter having an input to receive a plurality of optical signals sent on a corresponding plurality of wavelengths of an optical communication band, and to separate a first plurality of the optical signals within a first wavelength range within an amplification band of the optical communication band from a second plurality of the optical signals within a second wavelength range outside the amplification band of the optical communication band." Further, claim 32 recites similar subject matter. Applicant submits that the cited references do not disclose at least these features of claims 1 and 32.

The disclosed feature of separating a first wavelength within an optical amplification band from a second wavelength outside the amplification band facilitates full utilization of an ultra-wide optical communication band and provides appropriate protection strategies on the same network. The cited references of *Fujita* and *Milton* do not disclose or suggest separating the received signal into different wavelengths or determining whether the wavelengths fall within an amplification band. Further, Applicant submits that the cited references do not disclose or suggest treating wavelengths within the amplification band differently from those outside the amplification band. In fact, neither *Fujita* nor *Milton* disclose or suggest separating an optical signal into different wavelengths so that the different wavelengths, or groups, are

amplified or treated in a different manner. Therefore, *Fujita* and *Milton* do not disclose or suggest all the features of claims 1 and 32. Applicant respectfully requests that the obviousness rejection of claims 1 and 32 be withdrawn.

Claims 1-8 and 18 were rejected as allegedly rendered obvious by U.S. Patent No. 5,937,116 (*Seto*). The Office Action took the position that *Seto* discloses all the features of claims 1-8 and 18, "that the band splitter separates a first plurality of the optical signals within a first wavelength range of the optical communication band from a second plurality of the optical signals within a second wavelength range of the optical communication band." The Office Action then alleged that *Seto* describes it is possible to de-multiplex, or separate, an optical signal into optical signals for respective channels and that it would be obvious to modify *Seto* to separate the first and second wavelength ranges. Applicant submits that *Seto* does not disclose or suggest all the features of the presently pending claims.

Claim 1, from which claims 2-8 and 18 depend, is discussed above.

*Seto* relates to an optical transmission system and method using wavelength division multiplexed signals. *Seto* describes transmitting wavelength-multiplexed signals of a plurality of channels to which different wavelengths are assigned over an optical transmission path. *Seto* describes the system using an optical transmission terminal station for transmitting the wavelength-multiplexed signals to the optical transmission path. Referring to Figure 1 of *Seto*, the optical transmission system includes a multiplexer and a de-multiplexer. *Seto*, however, does not disclose or suggest a band

splitter to separate a first plurality of the optical signals within a first wavelength range within an amplification band of the optical communication band from a second plurality of the optical signals within a second wavelength range outside the amplification band of the optical communication band.

In contrast, as discussed above, claim 1 recites "a band splitter having an input to receive a plurality of optical signals sent on a corresponding plurality of wavelengths of an optical communication band, and to separate a first plurality of the optical signals within a first wavelength range within an amplification band of the optical communication band from a second plurality of the optical signals within a second wavelength range outside the amplification band of the optical communication band." Applicant submits that *Seto* does not disclose or suggest at least this feature of claim 1.

Applicant submits that *Seto* does not disclose or suggest the multiplexer separating an optical signal or a plurality of optical signals into a first wavelength range within an amplification band and a second wavelength range outside the amplification band. In fact, applicant submits that *Seto* does not disclose or suggest using an amplification band to differentiate between the wavelengths found in the optical signal. Thus, applicant maintains that *Seto* does not disclose or suggest all the features of claim 1. Applicant respectfully requests that the obviousness rejection of claims 1-8 and 18 be withdrawn.

Claim 9 was rejected under 35 U.S.C. §03(a) as allegedly being unpatentable over *Seto* in view of U.S. Patent No. 5,760,934 (*Sutter et al.*) Claim 10 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seto* in view of *Sutter*, and further in

view of *Fujita*. Claims 11 and 12 were rejected under 35 U.S.C. §03(a) as allegedly being unpatentable over *Seto* in view of U.S. Patent No. 5,793,745 (*Manchester*). Claims 16 and 17 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Seto* in view of U.S. Patent No. 6,201,907 (*Farries*). Claim 19 was rejected under 35 U.S.C. §03(a) as allegedly being unpatentable over *Seto* in view of U.S. Patent No. 6,278,536 (*Kai et al.*) Applicant submits that these claims are not disclosed or suggested by the cited references, either alone or in combination.

Applicant submits that the additional references cited by the Office Action do not disclose or suggest those features of the claims missing from *Fujita*, *Milton* and *Seto*. For example, none of the cited references discloses or suggests a band splitter having an input to receive a plurality of optical signals sent on a corresponding plurality of wavelengths of an optical communication band, and to separate a first plurality of the optical signals within a first wavelength range within an amplification band of the optical communication band from a second plurality of the optical signals within a second wavelength range outside the amplification band of the optical communication band. Moreover, the Office Action does not allege that the additional references are used to teach this feature.

Further, claims 9-12, 16-17 and 19 depend from independent claim 1. As discussed above, claim 1 is not rendered obvious in view of the cited references. If an independent claim is not obvious, then any claim depending therefrom also is not obvious. MPEP 2143.03. Therefore, applicant submits that the dependent claims are not

disclosed or suggested by the cited references. Applicant respectfully requests that the obviousness rejections to claims 9-12, 16-17 and 19 be withdrawn.

Claim 21 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,602,002 (*Srivastava et al.*) The Office Action took the position that *Srivastava* disclosed all the features of claim 21, except "that the output ports are associated with destination nodes." The Office then alleged that *Srivastava* taught "that each branch is associated with one of four routers." The Office Action then alleged that "one of ordinary skill in the art would have been motivated to route optical signals to branches associated with routers for the purpose of providing a high-capacity optical transmission arrangement." Applicant submits that the cited reference fails to disclose or suggest all the features of claim 21.

Claim 21, upon which claims 22-31 depend, recites a method for fully utilizing an optical spectrum spanning a predefined low-attenuation region of an optical transmission spectrum, for communicating information on optical fibers of an optical network. The method includes separating optical signals within the predefined low-attenuation region into in-band and out-band optical signals. The in-band signals substantially correspond to a first wavelength range within the predefined low-attenuation region designated for optical amplification, and wherein the out-band signals substantially correspond to a second wavelength range within the predefined low-attenuation region and exclusive of the first wavelength range. The method also includes routing the in-band and out-band optical signals to in-band and out-band output ports associated with destination nodes for

the in-band and out-band signals respectively. The method also includes combining the in-band and out-band optical signals from the in-band and out-band output ports to provide a united collection of the optical signals for collective transmission.

*Srivastava* relates to a high-capacity transmission arrangement. *Srivastava* describes utilizing a plurality of laser sources and a plurality of y-band optical amplifiers to transmit at 1 terabit/second rates over significant distances of optical fiber. *Srivastava* describes a plurality of optical sources and a plurality of y-band optical amplifiers connected in series. Each individual amplifier includes a split-band architecture where individual sub-bands of the optical energy traversing the amplifier are separated, and then amplified, in parallel prior to recombination and subsequent output. *Srivastava*, however, does not disclose or suggest routing the in-band and out-band optical signals to in-band and out-band output ports associated with destination nodes for the in-band and out-band signals respectively.

In contrast, claim 21 recites "routing the in-band and out-band optical signals to in-band and out-band output ports associated with destination nodes for the in-band and out-band signals respectively." Applicant submits that *Srivastava* fails to disclose or suggest at least this feature of claim 21. As noted above, *Srivastava* describes separating individual sub-bands of optical energy and amplifying the sub-bands prior to output. Applicant submits that this aspect of *Srivastava* does not disclose or suggest routing the in-band and out-band optical signals to in-band and out-band output ports associated with destination nodes. Therefore, *Srivastava* fails to disclose or suggest at least this feature

of claim 21. Applicant respectfully requests that the obviousness rejection of claim 21 be withdrawn.

Claim 22 was rejected under 35 U.S.C. §03(a) as allegedly being unpatentable over *Srivastava* in view of *Fujita*. Claim 23 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Srivastava* in view of *Fujita*, and further in view of *Sutter*. Claims 28-31 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Srivastava* in view of U.S. Patent No. 6,504,638 (*Tanaka et al.*) Applicant submits that the cited references fail to disclose or suggest all the features of presently pending claims 22, 23 and 28-31.

As discussed above, *Srivastava* does not disclose or suggest all the features of independent claim 21. Claims 22, 23 and 28-31 depend from claim 21. The cited references with regard to these claims fail to disclose or suggest those features of *Srivastava* missing from claim 21. Specifically, the additional cited references do not disclose or suggest routing the in-band and out-band optical signals to in-band and out-band output ports associated with destination nodes for the in-band and out-band signals, respectively.

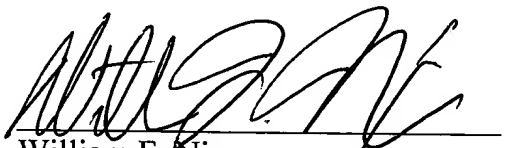
Further, claim 21 is not rendered obvious by the combination of the additional references, either alone or in combination. If an independent claim is not obvious, then any claim depending therefrom also is not obvious. MPEP 2143.03. Therefore, for at least these reasons, applicant respectfully requests that the obviousness rejections to claims 22, 23 and 28-31 be withdrawn.

It is submitted that, like the allowed and allowable claims, each of claims 1-12, 16-19, 21-23 and 28-32 recite subject matter that is neither disclosed nor suggested in the cited references. It is therefore respectfully requested that all of claims 1-34 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: Petition for Extension of Time